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SPRINGS REMOVAL ACTION PILOT STUDY WORK PLAN

MILLS GAP ROAD GROUNDWATER CONTAMINATION SITE

**235 Mills Gap Road
Asheville, Buncombe County, North Carolina
EPA ID: NCD003149556
CERCLA Docket No. CERCLA-04-2004-3755**

Prepared for:

**CTS Corporation
905 West Boulevard North
Elkhart, Indiana 46514**

Prepared by:

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AMEC Project 6690-03-9450

August 11, 2014



August 11, 2014

Ms. Samantha Urquhart-Foster
Superfund Remedial and Site Evaluation Branch
U.S. Environmental Protection Agency
61 Forsyth Street, S.W.
Atlanta, Georgia 30303-8960

**Subject: Springs Removal Action Pilot Study Work Plan
Mills Gap Road Groundwater Contamination Site
235 Mills Gap Road, Asheville, Buncombe County, North Carolina
AMEC Project 6690-03-9450
EPA ID: NCD003149556
CERCLA Docket No. CERCLA-04-2004-3755**

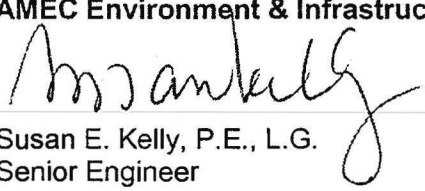
Dear Ms. Urquhart-Foster:

Please find attached the Springs Removal Action Pilot Study Work Plan (Removal Work Plan) for the above-referenced Site. AMEC Environment & Infrastructure, Inc. prepared this Removal Work Plan on behalf of CTS Corporation in accordance with the 2004 Administrative Order on Consent for Removal Action between the United States Environmental Protection Agency (USEPA) Region 4, CTS Corporation, and Mills Gap Road Associates. This Removal Work Plan has been prepared as requested by USEPA in a letter dated June 14, 2014.

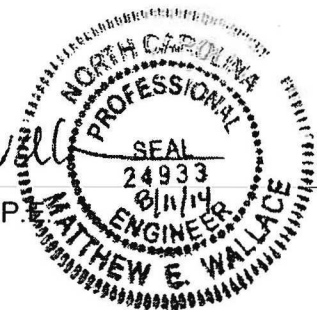
If you have questions regarding this Removal Work Plan, please contact us at (828) 252-8130.

Sincerely,

AMEC Environment & Infrastructure, Inc.


Susan E. Kelly, P.E., L.G.
Senior Engineer


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LIST OF ACRONYMS

AMEC	AMEC Environment & Infrastructure, Inc.
COPC	constituent of potential concern
FSAP	Field Sampling and Analysis Plan
HASP	Health and Safety Plan
OSWER	USEPA Office of Solid Waste and Emergency Response
ppbv	parts per billion by volume
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
RI/FS	Remedial Investigation/Feasibility Study
TCE	trichloroethene (also, trichloroethylene)
USEPA	United States Environmental Protection Agency
VI	vapor intrusion
VOC	volatile organic compound



1.0 INTRODUCTION

This document presents the Springs Removal Action Pilot Study Work Plan (Removal Work Plan) associated with the Mills Gap Road Groundwater Contamination Site (Site; also known as the CTS of Asheville, Inc. Superfund Site) located at 235 Mills Gap Road in Asheville, Buncombe County, North Carolina (Figure 1). The activities described in this Removal Work Plan will be performed pursuant to the 2004 Administrative Order on Consent for Removal Action between the United States Environmental Protection Agency (USEPA) Region 4, CTS Corporation, and Mills Gap Road Associates. This Removal Work Plan has been prepared in response to a USEPA letter dated July 10, 2014, requesting a work plan to address the on-going vaporization of volatile organic compounds (VOCs) from groundwater discharging from the springs east of the Site. This Removal Work Plan describes the activities proposed to evaluate mitigation of groundwater discharges at the springs.

1.1 SITE DESCRIPTION

The approximate center of the Site is located at north latitude 35°29'36" and west longitude 82°30'25". The Site formerly contained an approximate 95,000-square foot, single-story brick and metal structure on the southern portion of the Site. The building was demolished in December 2011 and the concrete building pad remains intact. The northeastern portion of the Site contains an asphalt-paved parking area and asphalt-paved driveways are located parallel to the north (front) of the building and southeast (rear) of the building. A six-foot high chain-link fence surrounds the Site and a locked gate at the north end of the Site controls access to the Site from Mills Gap Road. The Site is unoccupied.

1.2 BACKGROUND INFORMATION

The results of previous assessments determined that a contaminated groundwater plume is present at and adjacent to the Site. The groundwater plume in the unconsolidated formation (i.e., above bedrock) has generally been delineated to the north and the south, but not to the east and west of the Site. The primary constituents detected in soil and groundwater samples collected during previous Site investigations include VOCs related

to chlorinated solvents, such as trichloroethene (TCE), and petroleum constituents related to fuel oil.

Previous assessment activities conducted by USEPA and CTS Corporation included air sampling and air monitoring in the area of the Site. In April 2014, air samples collected in the area of the springs east of the Site contained concentrations of TCE above USEPA Region 4's recommended removal management levels.

1.3 OBJECTIVE OF THE REMOVAL WORK PLAN

The objective of this Removal Work Plan is to evaluate the potential for reducing groundwater discharge to the area of springs/seeps east of the Site, which should result in a reduction of TCE vapor emanating from the springs area. If the results from the implementation of this Removal Work Plan demonstrate that the concepts are technically and economically feasible, the data that has been collected will be used to design a full-scale removal system.



2.0 REMOVAL PILOT STUDY

This removal pilot study will evaluate the effects of groundwater removal on the amount of groundwater emanating as surface water in the springs area east of the Site. The study will perform temporary groundwater pumping from the springs area and monitoring the associated effects to the groundwater elevation and surface water presence/flow.

2.1 PROPOSED WELLS

Several wells will be installed to facilitate the pilot study. One extraction well (EW-1) will be installed near springs SPR-02 and -03. Three observation wells (OW-4 through OW-6) will be installed at varying distances from the extraction well to provide groundwater elevation data during the study. Three existing observation wells (OW-1 through OW-3) will be used for collection of additional groundwater elevation data. The proposed and existing well locations are shown in Figure 2.

2.2 WELL AND OBSERVATION POINT CONSTRUCTION

2.2.1 Extraction Well

One six-inch diameter extraction well will be constructed in the overburden soils to an approximate depth of 40 feet below ground surface (bgs) using hollow stem auger drilling techniques. The actual screened interval depth will be determined based on the conditions encountered during well installation.

Filter sand (No. 2) will be placed around the 0.020-inch slot well screen. Sand will be placed to at least two feet above the screen and at least two feet of bentonite chips will be placed above the screen pack. A cement/bentonite grout will be placed above the bentonite seal to ground surface. An approximate three-foot by three-foot horizontal dimension concrete well pad will be constructed around the wellhead and the wellhead will be fitted with a locking well cap.

The extraction well will be developed by pumping and surging methods until the water from the well is free of sediment and water turbidity is less than 10 Nephelometric

Turbidity Units (NTUs), or until turbidity readings stabilize at lowest levels achievable using pumping and surging methods

2.2.2 Observation Wells

Three, two-inch diameter PVC, approximately 25-foot deep monitoring wells will be drilled at varying distances from the extraction well using hollow stem auger drilling techniques. The wells will be constructed with 20 feet of well screen and 5 feet of riser pipe. Filter sand (No. 1) will be placed around the 0.010-inch slotted screen to at least one foot above the screen. Bentonite chips will be placed to at least one foot above the sand pack and a cement/bentonite grout will be placed from the top of the bentonite seal to ground surface. Approximate two-foot by two-foot horizontal dimension concrete well pads will be constructed around the wellheads and the wellheads will be fitted with locking well caps.

The observation wells will be developed by pumping and surging methods until the water from the wells is free of sediment and water turbidity is less than 10 NTUs, or until turbidity readings stabilize at lowest levels achievable using pumping and surging methods.

2.2.3 Observation Points

Up to four, two-inch diameter PVC temporary observation points will be installed prior to beginning the pilot study. The temporary observation points will be advanced by manually hammering a five-foot long section of 0.010-inch slotted screen fitted with a pointed end cap in the seep area. The temporary observation points will be fitted with locking well caps, and will be removed after completion of the pilot study.

2.3 BACKGROUND DATA COLLECTION

Prior to conducting the pilot study, pressure transducers equipped with data loggers will be deployed in the extraction well, new observation wells, and select observation points. Water level data will be collected for at least 24 hours prior to beginning the pump tests. At least three iterations of manual water level measurements will be conducted to confirm the accuracy of the pressure transducers.

2.4 STEP DRAWDOWN TEST

A step drawdown test will be performed on the extraction well to determine the approximate aquifer capacity and to properly size equipment for the constant rate pumping test. A submersible pump with a pumping capacity of approximately 40 gallons per minute will be installed in the extraction well. The step drawdown will be completed as follows:

1. Confirm pressure transducers remain operational in the extraction well, observation wells, and observation points.
2. Set up equipment (pump, generator, flow meter, etc.).
3. Begin pumping at the lowest pumping rate at a pre-determined start time. Adjust flow valve as required to maintain the target flow rate.
4. Record total volume pumped at five-minute intervals for 15 minutes. Then record total volume pumped at 15-minute intervals.
5. Record manual water level readings in the observation wells prior to starting new flow rates and note surface water conditions in the springs/seep area.
6. After the water level in the extraction well has stabilized, increase the pumping rate and repeat steps 4 through 6. Repeat this process for two more increased pumping rates until a maximum sustainable pumping rate has been determined.
7. Allow groundwater to equilibrate for a minimum of 24 hours before beginning additional testing.
8. At the end of the recovery period, stop data collection and download data.

2.5 CONSTANT RATE PUMP TEST

Data from the step drawdown test will be used to determine an appropriate constant rate pumping test flow rate. A constant rate pumping test will be performed on the extraction well. A submersible pump with a maximum pumping capacity higher than the determined pumping rate will be installed in the extraction well. The constant rate pumping test will be completed as follows:

1. Confirm pressure transducers remain operational in the extraction well, observation wells and observation points.
2. After groundwater has stabilized from the step drawdown test, or at least 24 hours has elapsed, begin pumping groundwater at the constant rate test pumping rate. Adjust valve as required to maintain the target flow rate.
3. Record total volume pumped at five-minute intervals for 15 minutes. Record total volume pumped at 15-minute intervals. Confirm the pumping rate is the specified rate and adjust as needed. Record any adjustments.



4. Confirm pressure transducers remain operational at 2-hour intervals and note surface water conditions in the springs/seep area.
5. After 20 hours, collect a groundwater sample. The groundwater sample will be submitted for analysis of VOCs according to USEPA Method 8260, semi-volatile organic compounds according to USEPA Method 8270, total iron and manganese according to EPA Method 6010, and ferrous iron according to Standard Method 3500Fe on a standard 21-day turnaround with a full data package deliverable.
6. Continue the pumping and monitoring activities for at least 24 hours or until the water level in the extraction well has stabilized at the constant rate flow rate.
7. Once pumping is completed, collect manual water level readings from the extraction well at five-minute intervals for one hour or until 90 percent recovery at the pumping well is achieved, whichever occurs first.
8. Allow groundwater to equilibrate for a minimum of 24 hours. At the end of the recovery period stop data collection and download data.

At the completion of the pump tests, the springheads at springs SPR-02, -03 and -04 will be filled with bentonite pellets and the upper concrete tiles will be removed.

2.6 DECONTAMINATION PROCEDURES

2.6.1 Decontamination Pad

A decontamination pad will be constructed for field cleaning of drilling and sampling equipment. The decontamination pad will be constructed such that it that will meet the following requirements:

- The pad will be constructed in an area known or believed to be free of surface contamination and will be of sufficient size to accommodate drilling equipment.
- The pad will be constructed on a level surface that will facilitate the collection of wastewater. This will be accomplished by either constructing the pad with one corner lower than the rest or by creating a lined sump or pit in one corner or along one side.
- The temporary pad will be lined with a water impermeable material with no seams within the pad. The material will be either easily replaced (disposable) or repairable. The pad will be inspected for leaks on a daily basis.
- Sawhorses or racks will be used to hold equipment while being cleaned.
- At the completion of the Site activities, the decontamination pad will be dismantled. Wastewater remaining in the pad will be removed and containerized for disposal.

2.6.2 Equipment Decontamination

The following procedures will be used to decontaminate the drilling equipment:



- The augers will be placed on racks or sawhorses located in the decontamination pad and remaining soil will be removed by hand and potable water. The equipment will be scrubbed down with potable water and soap using a brush, if necessary, to remove particulate matter and surface films. Equipment may be steam cleaned (soap and high pressure hot water) as an alternative to brushing. Augers that are steam cleaned will be placed on racks or sawhorses at least two feet above the floor of the temporary decontamination pad.
- Decontamination fluids will be transferred to a 55-gallon drum on a daily basis, if sufficient fluids have accumulated to allow for transfer to a drum.

The groundwater extraction pump will be decontaminated at the end of the pilot study by placing the pump in a 55-gallon drum filled with potable water and industrial soap. The pump will be turned on to recirculate decontamination water through the pump. The pump will then be placed in a drum of potable water and turned on to recirculate potable water through the pump.

2.7 MANAGEMENT OF INVESTIGATION DERIVED WASTE

Soil and water from well construction and development and decontamination fluids (investigation derived waste; IDW) will be stored in DOT-approved 55-gallon drums. Liquid IDW will be accumulated separately from soil IDW and each drum will be labeled as to the drum's contents. Disposable items, including PPE and decontamination pad materials that are not considered hazardous, will be placed in trash bags and disposed of in a collection container for ultimate disposal at a permitted municipal solid waste landfill.

Drums will be stored in an accumulation area inside the fenced area east of the Site. The drums will be transported to an approved disposal facility for disposal as an anticipated hazardous waste. Waste characterization samples will be collected if required by the disposal facility.

Groundwater extracted from the extraction well during the pump test will be containerized before being disposed of off-site at an approved disposal facility. Large-capacity tanks (i.e., frac tanks) will be used to provide up to approximately 40,000 gallons of storage capacity. The tanks will be staged at the former plant site. Samples of the extracted groundwater will be collected during the pump test and used to determine the waste characterization. In accordance with paragraph 23 of the Administrative Order on Consent



for Removal Action, approval of the disposal facility will be requested and obtained from USEPA prior to transport of the waste to the facility, if the waste is determined to be hazardous.

2.8 PILOT STUDY REPORTING

A report will be prepared and submitted to USEPA. The report will include the results of the pumping tests and an evaluation of the feasibility of full-scale implementation of a removal action.

2.9 PILOT STUDY SCHEDULE

The proposed schedule for the implementation of the Removal Work Plan is presented below.

Activity	Time to Complete
USEPA approval of Removal Work Plan	30 days after submittal (assumed 30-day review/approval period)
Commence implementation of pilot study	Within 30 days of USEPA approval of Work Plan
Well installation	Estimated 5 working days to complete
Pump tests	Start within 5 working days of well installation completion, with an estimated 5 working days to complete
Removal Action Pilot Study Report	Within 45 days after receipt of laboratory data package.

3.0 AIR SAMPLING

As indicated in USEPA's letter dated July 10, 2014, air sampling at the locations sampled in June 2014 may be necessary. In coordination with USEPA, we will discuss whether the following sampling should be performed. The sampling, if deemed necessary, will be performed in accordance with the Supplement to Vapor Intrusion Assessment Work Plan, Revision 4 (Supplemental VI Work Plan), dated June 11, 2014. The following samples will be collected on a quarterly basis, pending access by the homeowner and occupancy of the residence at the time of sampling, for up to two quarters:

Information Redacted pursuant to 5 U.S.C.
 Section 552 (b)(6), Personal Privacy

Sample Location/Address	Sample Type
[] Mills Gap Road	Ambient (No. 1 north)
[] Mills Gap Road	Ambient (No. 2 south)
[] Mills Gap Road	indoor
[] Mills Gap Road	ambient
[] Mills Gap Road	indoor
[] Clove Bud Court	ambient
[] Clove Bud Court	crawlspace
[] Clove Bud Court	Indoor (contingent*)
[] Clove Bud Court	ambient
[] Clove Bud Court	crawlspace
[] Clove Bud Court	Indoor (contingent*)
[] Concord Road	ambient
[] Concord Road	indoor
[] Concord Road	crawlspace
[] Concord Road	Indoor (contingent*)
[] Busbee Knoll	ambient

* Analysis of indoor air samples will be contingent upon analytical results of associated crawlspace air sample as compared to USEPA Region 4 indicated 'trigger' TCE concentration of 1 µg/m³.

Completion of additional Occupied Dwelling Questionnaires for the locations is not anticipated at this time. During the deployment of sample canisters, chemical storage at the sampling locations will be noted and chemicals will be segregated during the sampling period, if deemed necessary by the Field Operations Leader.



If the pilot study is successful and a full scale removal action is implemented, then air sampling at the homes in the area of the springs where temporary relocation was offered will be performed approximately one month after implementation of the removal action.

3.1 REPORTING

A Vapor Intrusion Assessment Report will be prepared and submitted to USEPA. The Report will provide a description of the sampling and analysis activities, a tabulation of the analytical results, data validation results, and a vapor intrusion risk evaluation, as described in the Supplemental VI Work Plan.

3.2 SCHEDULE

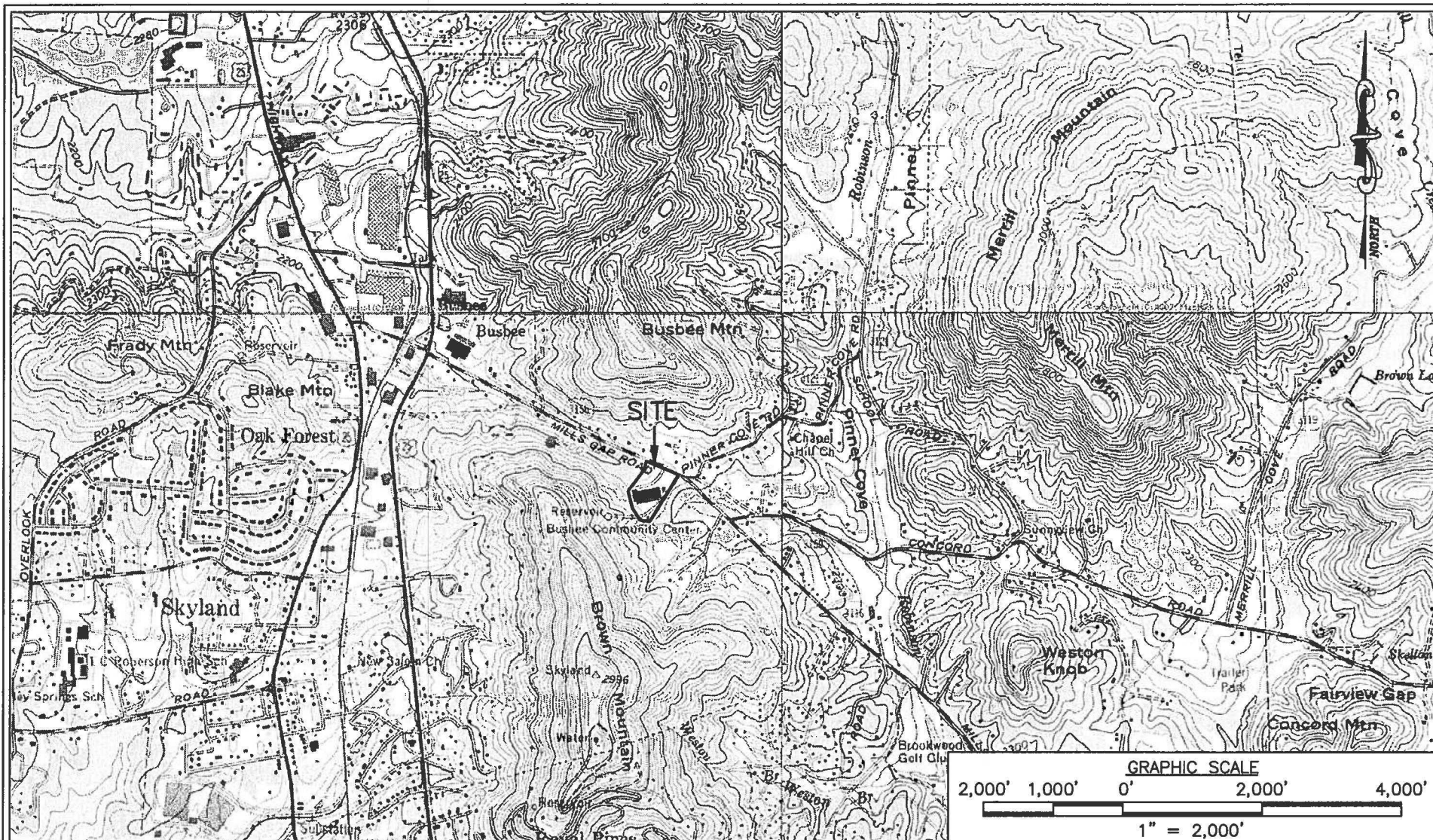
The proposed schedule for the air sampling is presented below.

Activity	Time to Complete
Commence implementation of air sampling	As scheduled by USEPA, with two weeks advance notice
VI Assessment field activities	Estimated 2 days to complete
Receive laboratory data	Within estimated 21 days of sample collection
Vapor Intrusion Assessment Report	Within 45 days after receipt of laboratory data package

Mills Gap Road Groundwater Contamination Site
Springs Removal Action Pilot Study Work Plan
AMEC Project 6690-03-9450
August 11, 2014



FIGURES



TOPOGRAPHIC SITE LOCATION MAP
MILLS GAP ROAD GROUNDWATER CONTAMINATION SITE
ASHEVILLE, NORTH CAROLINA

amec

DRAWN: SEK

ENG CHECK: --

DATE: AUGUST 2014

PROJECT: 6690-03-9450

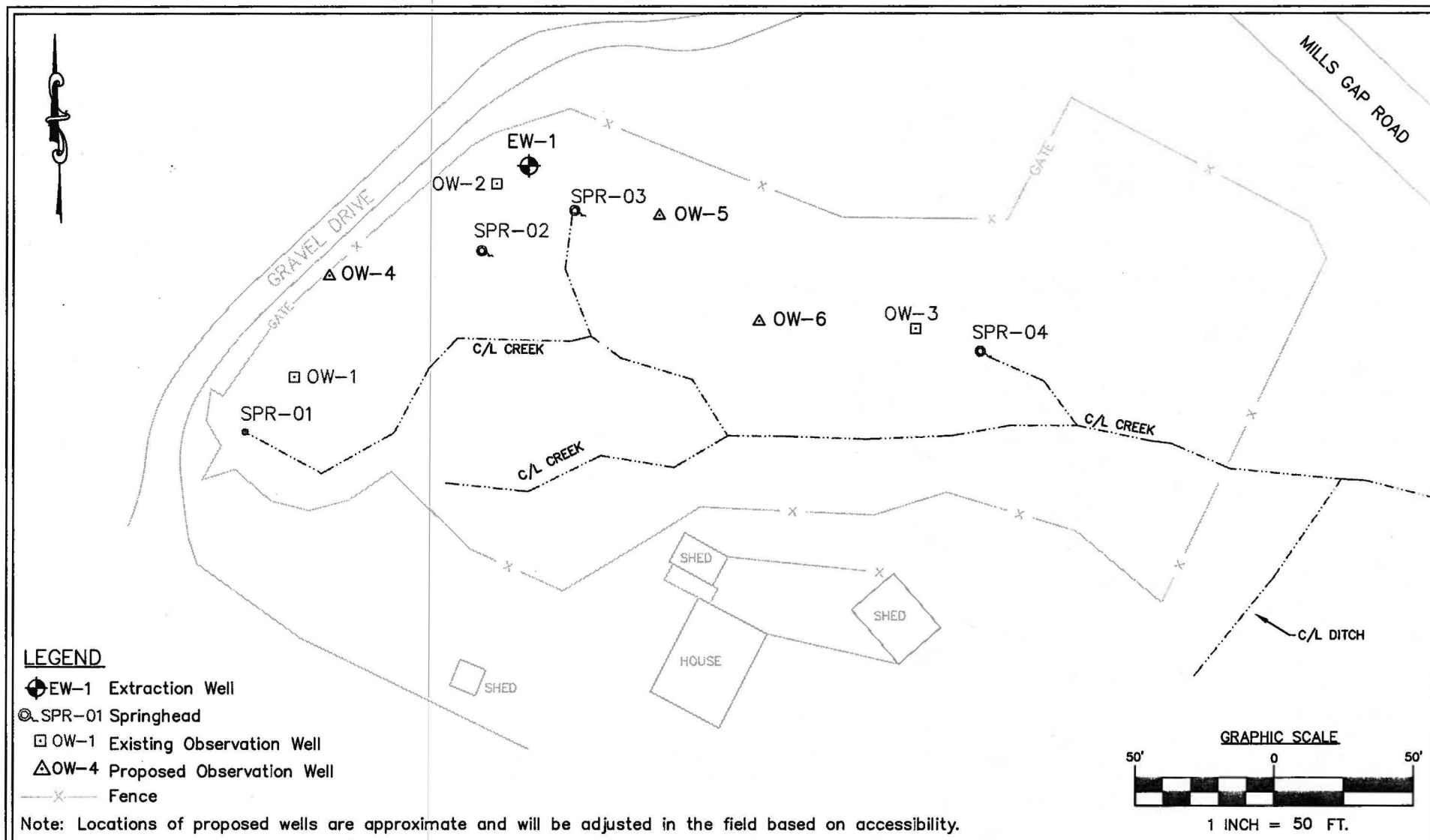
DFT CHECK: MEW

APPROVAL: MEW

SCALE: 1" = 2,000'

FIGURE: 1

REFERENCE: USGS QUADRANGLES: ASHEVILLE (1961), OTEEN (1962), FRUITLAND (1978) AND SKYLAND (1978)



PILOT STUDY LAYOUT
MILLS GAP ROAD GROUNDWATER CONTAMINATION SITE
ASHEVILLE, NORTH CAROLINA



DRAWN: SEK	ENG CHECK: --	DATE: AUGUST 2014	PROJECT: 6690-03-9450
DFT CHECK: MEW	APPROVAL: MEW	SCALE: 1" = 50'	FIGURE: 2

REFERENCE: SURVEY PREPARED BY FREELAND & ASSOCIATES.